CLAIMS

1. A display, comprising:

(a) an electrophoretic display element capable of changing its appearance in response to an electric field; and

(b) a first electrode adjacent said display element, said first electrode comprising a protective layer adapted to prevent mechanical or electrochemical damage to said display element.

2. The display of claim 1 wherein said electrophoretic display element comprises:

(i) a capsule;

(ii) a dispersing fluid having a first optical property disposed within said capsule; and

(iii) at least one electrophoretically-mobile particle disposed within said capsule, said at least one electrophoretically-mobile particle having a second optical property different from said first optical property, said at least one electrophoretically-mobile particle adapted to change position within said capsule under the influence of an applied electric field, thereby changing the optical properties of said display element.

3. The display of claim 2 wherein said protective layer is flexible.

4. The display of claim 2 wherein said protective layer is adapted to prevent mechanical removal of said electrophoretic element from said display.

5. The display of claim 2 wherein said protective layer comprises a plurality of conductors extending therethrough.

6. The display of claim 1 wherein said first electrode is transparent and the protective layer is disposed upon said transparent electrode, said protective layer being capable of protecting said transparent electrode from degradation under the application of an electrical potential.

7. The display of claim 6 wherein said first electrode is transparent and comprises one or more oxides selected from the group consisting of indium oxide, tin oxide and indium tin oxide.

8. The display of claim 6 wherein said protective layer comprises at least one chemical composition selected from the group consisting of the metals nickel, palladium, platinum, ruthenium, rhodium, silver, aluminum, gold, titanium, chromium and zinc, and the oxides silver oxide (AgO), aluminum oxide (Al_2O_3), gold (III) oxide (Au_2O_3), titanium (II) oxide (TiO), titanium (IV) oxide (TiO_2), chromium (III) oxide (Cr_2O_3), chromium (VI) oxide (CrO_3), zinc oxide (ZnO), nickel (II) oxide (NiO), palladium (II) oxide (PdO), platinum (IV) oxide (PtO_2), ruthenium (IV) oxide (RuO_2), and rhodium (III) oxide (Rh_2O_3).

9. The display of claim 8 wherein said protective layer comprises palladium.

10. The display of claim 8 wherein said protective layer has a thickness not greater than approximately 10 nm.

11. A display, comprising:

(a) an electrophoretic display element; and

(b) a vapor-permeable electrode adjacent said display element.

12. The display of claim 11 wherein said electrophoretic display element comprises:

(i) a capsule;

(ii) a dispersing fluid having a first optical property disposed within said capsule; and

(iii) at least one electrophoretically-mobile particle disposed within said capsule, said at least one electrophoretically-mobile particle having a second optical property different from said first optical property, said at least one electrophoretically-mobile particle adapted to change position

within said capsule under the influence of an applied electric field, thereby changing the optical properties of said display element.

13. The display of claim 11 wherein said vapor-permeable electrode comprises an electrode permeable to water vapor.

14. The display of claim 11 wherein said vapor-permeable electrode comprises a reticulated electrically conductive structure.

15. The display of claim 14 wherein said vapor-permeable electrode comprises a wire mesh.

16. The display of claim 14 wherein said vapor-permeable electrode comprises a reticulated layer at least partially coated with an electrically conductive material.

17. The display of claim 14 wherein said vapor-permeable electrode comprises a reticulated layer at least partially impregnated with an electrically conductive material.

18. An electrostatically addressable display, comprising:

(a) an electrophoretic display element having a first surface and a second surface;

(b) a protective layer disposed adjacent said first surface of said display element, said protective layer capable of transmitting charge; and

(c) an electrode disposed adjacent said second surface of said display element.

19. The display of claim 18 wherein said protective layer is flexible.

20. The display of claim 18 wherein said electrophoretic display element comprises:

(i) a capsule;

(ii) a dispersing fluid having a first optical property disposed within said capsule; and

(iii) at least one electrophoretically-mobile particle disposed within said capsule, said at least one electrophoretically-mobile particle having a second optical property different from said first optical property, said at least one electrophoretically-mobile particle adapted to change position within said capsule under the influence of an applied electric field, thereby changing the optical properties of said display element.

21. The display of claim 20 wherein application of an electrostatic voltage of less than 1000 volts across the display creates an electrostatic voltage of at least 5 volts across the electrophoretic element.

22. The display of claim 20 wherein said protective layer disposed adjacent said first surface of said capsule comprises a layer having a resistivity less than 10^{12} ohm-centimeters and said electrophoretic element comprises a material having a resistivity greater than 10^{12} ohm-centimeters.

23. The display of claim 20 wherein said protective layer comprises a material having a resistivity greater than a resistivity of said electrophoretic element and a thickness that is not more than 20% of the thickness of a layer of said electrophoretic elements, whereby a resistance of said protective layer is approximately 20% of a resistance of said electrophoretic element.

24. The display of claim 19 wherein said protective layer disposed adjacent said first surface of said display element comprises a layer of polymeric material.

25. The display of claim 19 wherein said protective layer disposed adjacent said first surface of said display element comprises a layer that conducts charge in a direction substantially perpendicular to the layer.

26. The display of claim 19 wherein said protective layer disposed adjacent said first surface of said display element comprises a layer of an insulating material having a plurality of conductive structures extending therethrough.

27. The display of claim 19 wherein said protective layer disposed adjacent said first surface of said display element comprises a first region having a first resistivity and a second region having a second resistivity.

28. The display of claim 27 wherein said first region having a first resistivity and said second region having a second resistivity comprise a material which is doped differently within said first region and said second region.

29. The display of claim 27 wherein the less conductive of said first and said second regions is continuous and surrounds an array of isolated segments of the more conductive of said first and said second regions.

30. The display of claim 29 wherein said less conductive of said first and said second regions comprises vias providing access to said array of isolated segments.

31. The display of claim 29 wherein said less conductive of said first and said second materials comprises a region that is continuous and that surrounds an array of islands of the more conductive of said first and said second materials, and said less conductive of said first and said second materials comprises pinholes providing access to said array of islands.

32. The display of claim 19 wherein said protective layer disposed adjacent said first surface of said display element comprises a first region having a first resistivity and a plurality of regions having a second resistivity.

33. The display of claim 32 wherein said plurality of regions having a second resistivity comprises arrays of three islands.

34. A method of addressing an electrostatically addressable display element, comprising the steps of:

(a) providing an electrophoretic element comprising:

(i) a capsule;

(ii) a dispersing fluid having a first optical property disposed within said capsule; and

(iii) at least one electrophoretically-mobile particle disposed within said capsule, said at least one electrophoretically-mobile particle having a second optical property different from said first optical property, said at least one electrophoretically-mobile particle adapted to change position within said capsule under the influence of an applied electric field, thereby changing the optical properties of said display element;

(b) providing a protective layer disposed adjacent said capsule, said protective layer adapted to transmit charge;

(c) providing a first electrode disposed adjacent said capsule;

(d) disposing adjacent said protective layer an addressing electrode; and

(e) activating said addressing electrode in conjunction with said first electrode to subject said electrophoretic element to a selected one of said first applied electric field and said second applied electric field produced between said first electrode and said addressing electrode so as to address said electrophoretic element.

35. The method of claim 34 wherein:

step (b) comprises providing a layer of an insulating material having a plurality of conductive structures disposed therethrough ; and

step (e) comprises activating said addressing electrode in conjunction with said first electrode by touching at least one of said conductive structures so as to apply a selected one of said first applied electric field and said second applied electric field produced between said first electrode and said conductive structure so as to address said electrophoretic element.

36. The method of claim 35 wherein:

step (b) comprises providing a layer of a material having a more resistive region and a less resistive region, said less resistive region comprising at least one island adjacent said electrophoretic element, said more resistive region having at least one pinhole therethrough, said at least one pinhole providing access to the at least one island of more conductive material; and

step (e) comprises activating said addressing electrode in conjunction with said first electrode by emitting charge that passes through said at least one pinhole so as to apply a selected one of said first applied electric field and said second applied electric field produced between said first electrode and said at least one island so as to address said electrophoretic element.

37. The method of claim 34 wherein said addressing electrode comprises part of a printer apparatus through which said display element is passed to effect said addressing.

38. The method of claim 34 wherein said display element comprises two protective layers on opposed sides of said capsules, both said protective layers being adapted to transmit charge.

39. A display comprising:

(a) an electrophoretic display element capable of changing its appearance in response to an electric field;

(b) a protective layer secured to said display element, adapted to prevent mechanical damage thereto and capable of transmitting charge to said display element.

40. A display according to claim 39 wherein said display element is essentially laminar having opposed first and second surfaces and protective layers are secured to both said first and second surfaces.